

# **IKONOS Shipment Verification**

*Stennis Space Center*

## **IKONOS Workshop March 20, 2001**

### **Scientific Data Purchase Project Earth Science Enterprise**

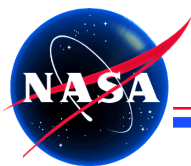
Rose Fletcher & Kara Holekamp, Coordinators  
Lockheed Martin Space Operations

Lamar Nicholson, Datastar, Inc.  
Computer Systems & Database Development

Fritz Policelli, Project Manager  
National Aeronautic and Space Administration

Deanna Dartez, Air-O-Space, PixSell, GBTech  
Tasking, Shipment Verification, Distribution

**John C. Stennis Space Center  
Commercial Remote Sensing Program (CRSP)  
Geospace Applications and Development Directorate (GADD)**



# Shipment Verification Objectives

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Why?

Certify Payment  
Fledgling Industry Benefits from Independent Check  
Scientists Benefit from Improvements & Knowledge

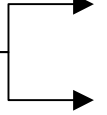
Registered to ISO 9001 Standard

Performed on 100% of the Data

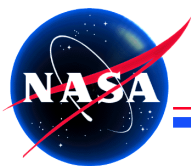


What?

- Check of Content and Readability
- Check for Gross Errors in Data Quality
- Verification of Tasking Requirements

Outcome — 

- Approved for Payment & Distribution
- Rejected and Returned to Supplier



# Shipment Verification Process

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Data Received

Automatic  
Ingest

Visual  
Inspection

Tasking  
Requirements

Supplemental  
Verification

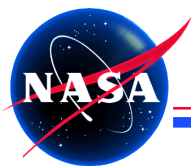
Database Status

Shipment  
Verification  
Report

**Tape Library**  
**StorageTEK Aegis L700**

**CAPACITY: 678 DLT Tapes**  
**24 TB Plus**

**ACCESS TIME: 7 seconds**



# Automatic Ingest Verification

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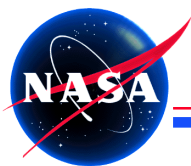
Extract files from media  
Import to image processing software  
Test data and metadata content  
Generate thumbnail images  
Generate histograms in MatLab  
Compute ground sample distance  
Compute square kilometers  
Compute percent zero value pixels

## Checks

*Read error*  
*Corrupt file*  
*Format not readable*  
*Missing image file*  
*Missing metadata file*  
*Filename mis-match*  
*Non-standard naming convention*  
*File size incorrect*  
*File size: Pan  $\neq$  MSI x 4*  
*GSD > 1.0 for PAN*  
*Supplier = Space Imaging*  
*Data\_Type = IKONOS*

## Metadata Fields/Values Not Present

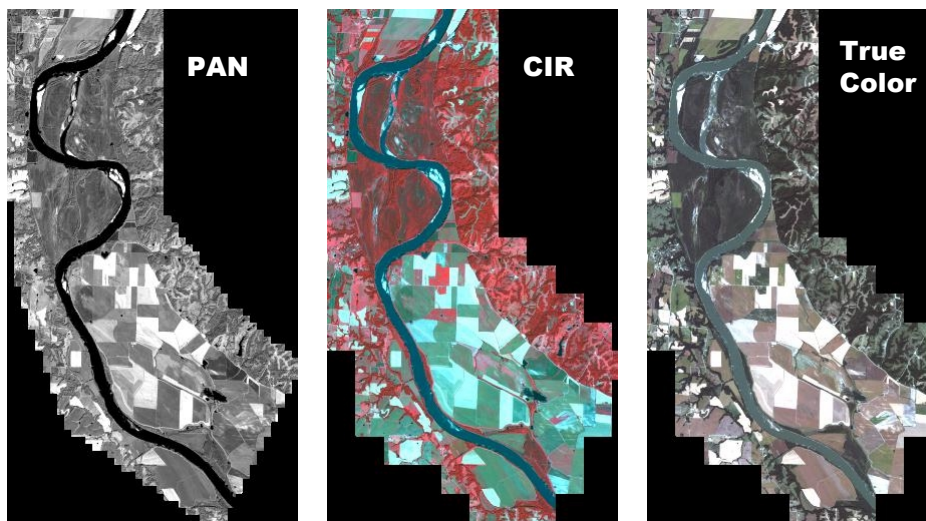
- *Row & Column*
- *X-GSD & Y-GSD*
- *Azimuth & Elevation*
- *Coordinates (center/bounding)*
- *Etc...*



# Visual Quality Inspection

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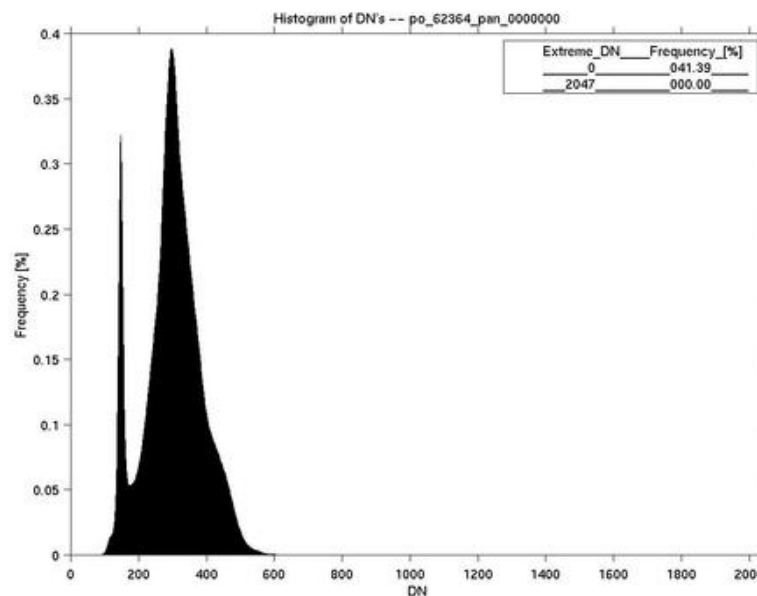
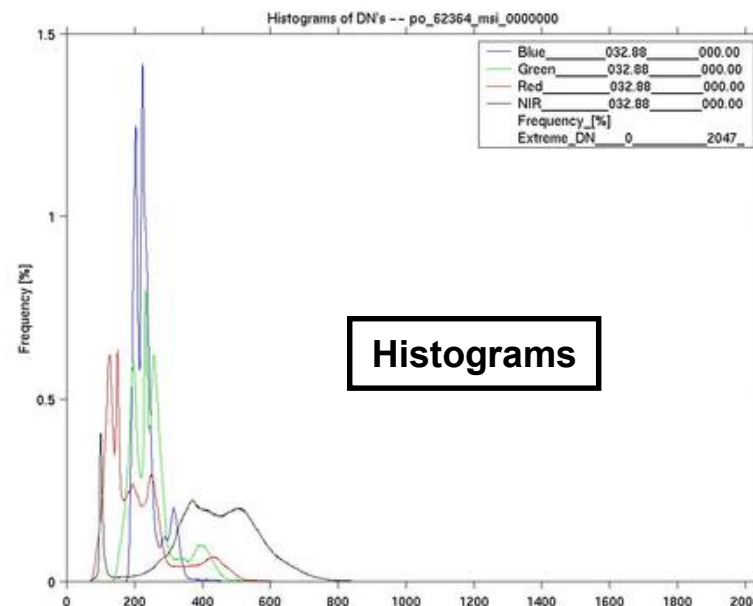
## Image Thumbnails

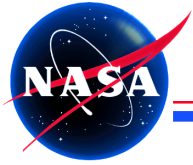


Task # 539 - Central Missouri

## Visual Inspection of Data Quality

- Cloud cover exceeding 10%
- Missing data
- Sensor errors
- Unique bands

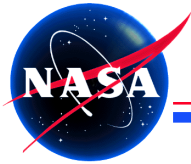




# Verification of Tasking Requirements

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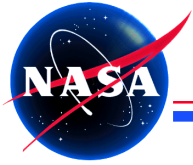
- **Acquisition Date**
- **Geographic Coverage (Coordinates)**
- **Square Kilometers**
- **Product**
- **Revisions**
- **Context of Total Order**



# Supplemental Verification

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- **Complex Geographic Coverage**
  - GIS Techniques
- **Square Kilometers**
  - Calculations for Partial / Multiple Scenes
- **Stereo Pair**
  - Socet Set Software for 3-D Viewing
- **Cloud Cover Analysis**
  - Erdas Imagine Classification
- **Acceptance from Principle Investigator**



# Future Process Improvements

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- **New Database Structure - More Integrated**
- **Automated Verification of Tasking Requirements**
- **Automated E-Mail Notification to Customers on Status of Order**
- **Coverage of Anticipated Deliveries**
- **Checks for FGDC & ECS Metadata Standard**